AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently amended) A computerized method for manipulating a plurality of control points, the plurality of control points defining a surface in a design for manufacture of parts and forming a plurality of rows along two non-parallel directions U and V, the method comprising:

adjusting the position of a control point in an intermediary row in the U direction to provide a smooth transition from the row of control points corresponding to a first edge along the U direction to a row of control points corresponding to a second edge along the U direction while retaining positions of control points in said first and second edges;

adjusting the position of the control point in an intermediary row in the V direction to provide a smooth transition from the row of control points corresponding to a first edge along the V direction to a row of control points corresponding to a second edge along the V direction while retaining positions of control points in said first and second edges; and

computing the new position of the control point based on the corresponding adjusted positions of the control point in the intermediary row in the U direction and the control points in the intermediary row in the V direction;

wherein the surface is selected from the group consisting of a Béziers surface and a Nurbs surface, and wherein the ~~surface~~ design for manufacture of parts is ~~represented~~ displayed in a CAD system.

2. (cancelled.)

3. (cancelled.)

4. (Currently amended) The computerized method of claim 1 ~~2~~ wherein the surface comprises a three-dimensional surface.

5. (Previously presented) The computerized method of claim 1 wherein computing the new position additionally comprises averaging the adjusted position of the control point in the intermediary row in the U direction and the adjusted position of the control point in the intermediary row in the V direction.

6. (Previously presented) The computerized method of claim 1 further comprising:
determining a reference axis for the first edge along the U direction, the second edge along the U direction, the first edge along the V direction, and the second edge along the V direction, wherein the method of determining the reference axis comprises:
for each edge:
determining an X vector comprising a first vector point located at a first extremity of the edge and a second vector point located at a second extremity of the edge;
determining a Z vector comprising the average of two extreme vectors orthogonally adjusted to the X vector, wherein the two extreme vectors comprise a vector formed by an extremity point and its neighbor; and
determining a Y vector comprising the vectorial product of the X vector and the Z vector.

7. (Previously presented) The computerized method of claim 6 wherein adjusting the position of a control point in an intermediary row in the U direction comprises adjusting the control point using the reference axis for the first edge along the U direction and the second edge along the U direction; and wherein adjusting the position of a control point in an intermediary row in the V direction further adjusting the control point using the reference axis for the first edge along the V direction and the second edge along the V direction.

8. (Previously presented) The computerized method of claim 1 further comprising:

determining if a row of control points corresponding to a first edge along the U direction belongs in a first U plane;

determining if a row of control points corresponding to a second edge along the U direction belongs in a second U plane; and

adjusting the control point using the first U plane and the second U plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane.

9. (Previously presented) The computerized method of claim 8 further comprising:

computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane; and

wherein adjusting the control point using the first U plane and the second U plane comprises projecting the control point on the adjusted U plane.

10. (Previously presented) The computerized method of claim 8 further comprising:

determining if a row of control points corresponding to a first edge along the V direction belongs in a first V plane;

determining if a row of control points corresponding to a second edge along the V direction belongs in a second V plane; and

adjusting the control point using the first V plane and the second V plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the V direction belongs in the first V plane and the row of control points corresponding to the second edge along the V direction belongs in the second V plane.

11. (Previously presented) The computerized method of claim 10 further comprising:

computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane;

wherein adjusting the control point using the first V plane and the second V plane comprises projecting the control point on the adjusted V plane.

12. (Previously presented) The computerized method of claim 10 further comprising:
computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane; and
computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane.

13. (Previously presented) The computerized method of claim 12 wherein adjusting the control point using the first U plane and the second U plane and adjusting the control point using the first V plane and the second V plane comprises projecting the control point on an intersection of the adjusted U plane and the adjusted V plane.

14. (cancelled.)

15. (cancelled.)

16. (Previously presented) The computerized method of claim 1 further comprising repeating the first adjusting step, second adjusting step, and computing step for each point that is not along the first edge in the U direction, second edge in the U direction, third edge in the V direction, and fourth edge in the V direction.

17. (Currently amended) A computerized method for manipulating a plurality of control points, the plurality of control points defining a surface in a design for manufacture of parts and forming a plurality of rows along two non-parallel directions U and V, the method comprising:
determining if a row of control points corresponding to a first edge along the U direction belongs in a first U plane;
determining if a row of control points corresponding to a second edge along the U direction belongs in a second U plane; and

adjusting control points using the first U plane and the second U plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane;

wherein the surface is selected from the group consisting of a Béziers surface and a Nurbs surface, and wherein the ~~surface~~ design for manufacture of parts is ~~represented~~ displayed in a CAD system.

18. (cancelled.)

19. (cancelled.)

20. (Previously presented) The computerized method of claim 17 wherein the surface comprises a three-dimensional surface.

21. (Currently amended) The computerized method of claim 17 ~~18~~ further comprising:

computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane;

wherein adjusting the control point using the first U plane and the second U plane comprises projecting the control point on the adjusted U plane.

22. (Currently amended) The computerized method of claim 17 ~~18~~ further comprising:

determining if a row of control points corresponding to a first edge along the V direction belongs in a first V plane;

determining if a row of control points corresponding to a second edge along the V direction belongs in a second V plane; and

adjusting the control point using the first V plane and the second V plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the V direction belongs in the first V plane and the row of control points corresponding to the second edge along the V direction belongs in the second V plane.

23. (Previously presented) The computerized method of claim 22 further comprising:
computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane;
wherein adjusting the control point using the first V plane and the second V plane comprises projecting the control point on the adjusted V plane.

24. (Previously presented) The computerized method of claim 22 further comprising:
computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane; and
computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane.

25. (Previously presented) The computerized method of claim 24 wherein adjusting the control point using the first U plane and the second U plane and adjusting the control point using the first V plane and the second V plane comprises projecting the control point on an intersection of the adjusted U plane and the adjusted V plane.

26. (cancelled)

27. (cancelled)

28. (Currently amended) A computerized method for manipulating a plurality of control points, the plurality of control points defining a surface in a design for manufacture of parts and forming a plurality of rows along two non-parallel directions U and V, the method comprising:
determining if a row of control points corresponding to a first edge along the U direction belongs in a first U plane;
determining if a row of control points corresponding to a second edge along the U direction belongs in a second U plane; and

constraining the control points using the first U plane and the second U plane, wherein the constraining only occurs if the row of control points corresponding to a first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane;

wherein the surface is selected from the group consisting of a Béziers surface and a Nurbs surface, and wherein the ~~surface~~ design for manufacture of parts is ~~represented~~ displayed in a CAD system.

29. (cancelled.)

30. (cancelled.)

31. (Previously presented) The computerized method of claim 28 wherein the surface comprises a three-dimensional surface.

32. (Previously presented) The computerized method of claim 28 further comprising:

computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane;

wherein constraining the control point using the first U plane and the second U plane comprises constraining the control point on the adjusted U plane.

33. (Previously presented) The computerized method of claim 28 further comprising:

determining if a row of control points corresponding to a first edge along the V direction belongs in a first V plane;

determining if a row of control points corresponding to a second edge along the V direction belongs in a second V plane; and

constraining the control point using the first V plane and the second V plane, wherein the constraining only occurs if the row of control points corresponding to a first edge along the V direction belongs in the first V plane and the row of control points corresponding to the second edge along the V direction belongs in the second V plane.

34. (Previously presented) The computerized method of claim 33 further comprising:
computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane;
wherein adjusting the control point using the first V plane and the second V plane comprises constraining the control point on the adjusted V plane.

35. (Previously presented) The computerized method of claim 33 further comprising:
computing an adjusted U plane for the control point to provide a smooth transition between the first U plane and the second U plane; and
computing an adjusted V plane for the control point to provide a smooth transition between the first V plane and the second V plane.

36. (Previously presented) The computerized method of claim 35 wherein constraining the control point using the first U plane and the second U plane and constraining the control point using the first V plane and the second V plane comprises constraining the control point to an intersection of the adjusted U plane and the adjusted V plane.

37. (cancelled.)

38. (cancelled.)

39. (Previously presented) A computer system for manipulating a plurality of control points in a design for manufacture of parts, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the system comprising:
a computer, wherein the computer comprises a memory and a processor; and
executable software residing in the computer memory wherein the software is operative with the processor to:

adjust the position of a control point in an intermediary row in the U direction to provide a smooth transition from the row of control points corresponding to a first edge along the U direction to a row of control points corresponding to a second edge along the U direction while retaining positions of control points in said first and second edges;

adjust the position of the control point in an intermediary row in the V direction to provide a smooth transition from the row of control points corresponding to a first edge along the V direction to a row of control points corresponding to a second edge along the V direction while retaining positions of control points in said first and second edges; and

compute the new position of the control point based on the corresponding adjusted positions of the control point in the intermediary row in the U direction and the control points in the intermediary row in the V direction.

40. (cancelled.)

41. (Previously presented) A computer system for manipulating a plurality of control points <u>in a design for manufacture of parts</u>, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the system comprising:

a computer, wherein the computer comprises a memory and a processor; and

executable software residing in the computer memory wherein the software is operative with the processor to:

determine if a row of control points corresponding to a first edge along the U direction belongs in a first U plane;

determine if a row of control points corresponding to a second edge along the U direction belongs in a second U plane; and

adjust the control point using the first U plane and the second U plane, wherein the adjustment only occurs if the row of control points corresponding to the first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane.

42. (cancelled.)

43. (Previously presented) A computer system for manipulating a plurality of control points in a design for manufacture of parts, the plurality of control points forming a plurality of rows along two non-parallel directions U and V, the system comprising:

a computer, wherein the computer comprises a memory and a processor; and

executable software residing in the computer memory wherein the software is operative with the processor to:

determine if a row of control points corresponding to a first edge along the U direction belongs in a first U plane;

determine if a row of control points corresponding to a second edge along the U direction belongs in a second U plane; and

constrain the control point using the first U plane and the second U plane, wherein the constraining only occurs if the row of control points corresponding to a first edge along the U direction belongs in the first U plane and the row of control points corresponding to the second edge along the U direction belongs in the second U plane.

44. (cancelled.)